SIEMENS

SIREMOBIL Compact

SP **Service Instructions**

SIREMOBIL Compact L SIREMOBIL Compact from Serial numbers 02001

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English

Doc. Gen. Date: 09.04

Print No.: SPR2-130.061.02.11.02 Replaces: SPR2-130.061.02.10.02

0 - 2 Revision

Chapter	Page	Revision	
all	all	11	

Document revision level

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SIREMOBIL Compact SPR2-130.061.02 Page 2 of 4 Siemens AG System Manual Rev. 11 09.04 CS PS 24 Medical Solutions

Contents 0 - 3

		Page
1	Prerequisites	_1 - 1
	Required documents	. 1 - 1
	Required tools, measurement and auxiliary devices	. 1 - 1
	Information regarding this document	. 1 - 2
	Position labels	. 1 - 2
	Measuring the equivalent device leakage current	. 1 - 6
	Covers	. 1 - 7
	Basic system	. 1 - 7
	Monitor trolley	
	I.I. cover	
	I.I. mini power supply	
	SIREPHOS cover	
	Back stop plate at the C-arm horizontal support	
2	Line voltage adjustment	_2 - 1
	Checking the line voltage on the monitor trolley	. 2 - 1
3	Checking the operating voltages	_3 - 1
	Low voltages	3 - 1
	I.I. voltages	
4	Loading the operating software	_4 - 1
	Control board D1, Host	. 4 - 1
	Storage of the error log as ASCII file	
_		
5	Adjustments / Programs	_5 - 1
	Generator adjustment (filament circuit learning program)	. 5 - 2
	Checking the generator adjustment	. 5 - 3
	Dose rate adjustment	. 5 - 5
	Prerequisites	. 5 - 5
	Preliminary steps	
	Correction factors	
	Dose rate to be set at the I.I. input screen:	
	Setting the dose rate for survey format	
	Setting the dose rate for zoom format	
	Concluding steps	
	Setting the maximum skin dose rate	
	Prerequisites	
	Measurement	
	Programming	
	Checking	

0 - 4 Contents

		Page
	Collimator, X-Iris	
	Prerequisites	
	Adjustments.	
	Concluding steps	
	Collimator, slot diaphragm	
	Prerequisites	
	Adjustment	
	Concluding steps	
	Collimator displays on the monitor	
	Prerequisites	
	Collimator display, X-Iris	
	Concluding tasks	
	Slot diaphragm	
	Prerequisites	
	Correction of the 0° position of the slot diaphragm display	
	Camera rotation	
	Calibrating the area dose product measurement device	
	Calculating the CONSTANT parameter (Qt * Kg)	
	Programming	
	Checking the programmed values	
	Checking the accuracy of the area dose product measurement device	
	Prerequisites	
	Preparations	
	Dose measurement	
	Calculating the area dose product	
	Evaluation	
	Overview of SIREMOBIL Compact parameters	
	Overview of MEMOSKOP C / C-E / C-SUB parameters	
	Configuring the MEMOSKOP	
	MEMOSKOP C-E, keyboard emulation	.5 - 29
	Configuring the video frequency	
	MEMOSKOP, configuration and country-specific language (User Setup)	
	MEMOSKOF, configuration and country-specific language (oser Setup)	.5 - 50
6	Replacing boards / replacing components	6 - 1
	Control board D1	. 6 - 1
	Power board D2	
	Interface board D3	
	D40 board for downward travel of the lifting column, Compact L only	
	VIDEOMED DC	
	Power supply M14, +5 V / +15 V / -15 V	
	Power supply M13, +12.3 V VIDEOMED DC	
	I.I. mini voltage supply	
	Collimator	
	SIREPHOS	. 6-5

Contents 0 - 5

9	Changes to previous version	9 - 1
8	Supplement, Measuring the tube current	_8 - 1
	SIREMOBIL Compact	
	Brake forces	. 7 - 1
7	Brake force / Brake torque	_7 - 1
	Laser targeting device	6 - 27
	Area dose product measurement device	
	MULTISPOT 2000	6 - 26
	MEMOSKOP C-SUB/ MEMOSKOP C-SUB & MOD	6 - 23
	MEMOSKOP C/ MEMOSKOP C & MOD	
	MEMOSKOP C-E 100	
	Checks and adjustments	
	Checking the camera optics centering at the I.I. output	
	Mounting the Compact optics	
	Removing the Compact optics	
	Replacing the Compact optics	
	Installing the new I.I	
	Removing the old I.I	
	Checking the temperature indicator	
	Replacing the I.I.	
		Page

0 - 6 Contents

Page

Prerequisites 1 - 1

Required documents

- SIREMOBIL Compact circuit diagram, G5429
- Circuit diagram for monitor X2080 or X2183
- SIREMOBIL Compact log book
- For the laser targeting device where used: Adjustment Instructions / Laser targeting

device RXR2-130.032.01...

Required tools, measurement and auxiliary devices

NOTE

All tools, measurement and auxiliary devices with the exception of those marked "*" are listed along with their specifications in the STC (Service Tools Catalog).

DMM
 e.g. "Fluke 8060 A", Part No. 97 02 101 Y4290
 Oscilloscope > 50 MHz
 e.g. Tektronix 2232, Part No. 97 02 234 Y3155

Dose measurement device e.g. PTW-DALI (no longer in ARTD)

or PTW-NOMEX, Part No. 97 08 637 Y0388 or PTW-DIADOS, Part No. 97 17 612 Y0388 e.g. Safety meter, Part No. 44 15 899 RV090

Protective conductor meter
 e.g. Safety meter, Part No. 44 15 899 RV090
 or Bender safety meter, Part No. 97 06 979 Y0526

- Service PC with WINDOWS 3.1 or 3.11 operating system*
- Service software (refer to SIREMOBIL Compact log book)*
- Connection cable, Service PC SIREMOBIL Compact (e.g. Part No. 99 00 440 RE999)

1 set of resolution tests
1 set of radiation filters
Center cross
e.g. Part No. 28 71 820 RE999
e.g. Part No. 97 98 596 G5321
e.g. Part No. 96 60 051 RE999

Special purpose oil (Optimol GmbH, Viscogen KL 300, 40g) Part No. 73 95 353 RH090

Heat conducting paste WPS
 Sealing compound
 e.g. Part No. 20 48 650 SRN 6400
 Part No. 20 49 716 SRN 6002

Tool kit*

1 set Allen keys*

200 N spring scale
 Torque wrench 20 Nm to 100 Nm
 e.g. Part No. 44 15 113 RH090
 e.g. Part No. 80 86 159 RE999

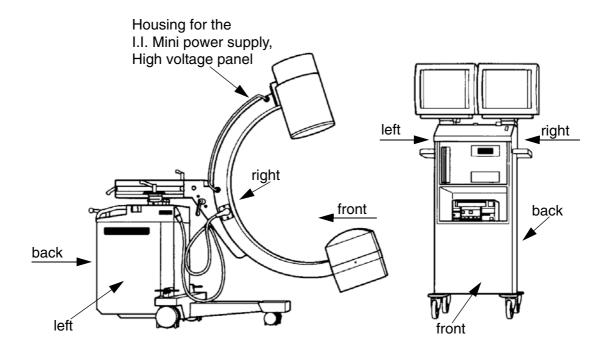


Fig. 1

Information regarding this document

These service instructions will assist you in adjusting the SIREMOBIL Compact beginning with serial number 02001 for routine operation. Not every adjustment is required each time the system is serviced.

Position labels

The labels used in these instructions (left, right, front and back) are explained in Fig. 1.

Prerequisites 1 - 3

Safety Information

∆WARNING

Risk of physical injury or death and damage to property! Observe

- the product-specific safety information in these instructions,
- the general safety information in the instructions TD00-000.860.01... and
- the general safety information according to ARTD Part 2.

Noncompliance can lead to death, physical injury or damage to property.

∆WARNING

Electrical voltage!

Noncompliance can lead to death, physical injury or damage to property.

After the system covers are removed, live parts are exposed. To prevent danger, the system must be disconnected from the line voltage before removing its covers. To do this, disconnect the system power plug or switch its power supply off and secure the power switch against accidental reactivation.

Any service required in connection with electrical voltage should be performed in accordance with general service information TD00-000.860.01...

∆WARNING

Electrical voltage!

Noncompliance can lead to death, physical injury or damage to property.

After servicing the primary circuit of the ON/OFF assembly (e.g. replacing the ON/OFF assembly or any of its components), you must measure and record the equivalent leakage current (see system manual or logbook).

∆WARNING

Danger of infection with pathogens!

In the case of noncompliance death or physical injury can arise.

This product is released for operation in operating rooms and can be contaminated with infectious blood or other body secretions. Avoid all contact with blood or other body secretions!

Comply strictly with the preventive measures against infectious diseases specified in ARTD-002.731.37...!

∆WARNING

Electrical voltage!

Noncompliance can lead to death, physical injury or damage to property.

After completing all service work and attaching all system covers, you must perform a protective ground wire test according to ARTD-002.731.17....

The protective ground wire resistance must not exceed 0.2 ohms.

∆WARNING

X-ray radiation!

Noncompliance can lead to death or physical injury.

When performing service work involving the emission of X-ray radiation, you must observe the radiation protection regulations. The radiation activity must be kept as low as possible (low kV and mA levels, short radiation time).

Keep as far away from the radiation source as possible. Radiation protection devices (lead partitions, etc.) and radiation-protection clothing (lead apron) must be used.

∆WARNING

Risk of physical injury and damage to property!

When performing service work on the horizontal slide of the basic unit (for example, when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and fall onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.

∆CAUTION

Risk of being burned by hot parts or components! Noncompliance can lead to light or medium burns, especially of the hands.

Once the covers have been removed, parts or components (e.g. power components, heat sinks, solenoid brakes) become exposed which may exhibit temperatures of up to 50°C in operation. To prevent burns, switch off the system power supply and let the system cool off for at least 5 minutes before resuming work.

∆CAUTION

Electrical voltage!

Noncompliance can lead to damage to property.

ESD protection guidelines must be observed when servicing.

Prerequisites 1 - 5

∆CAUTION

Danger of injury on mechanical parts!

Non-compliance can lead to minor up to moderately severe injuries, especially to the hands!

With covers removed, you can come into contact with parts such as flat plugs, threaded bolts, cut off cable ties or edges of components on which, in the case of inattention, injuries can arise due to crushing, cutting or grazing the skin, especially to the hands.

Perform the corresponding work with special care and attentiveness.

Wear working gloves if necessary.

Measuring the equivalent device leakage current

Regulations and scope for the subsidiaries

Within the scope of DIN VDE0751 part I 1, the equivalent device leakage current test must be performed. Outside the scope of DIN VDE0751, the subsidiaries must observe the following: refer to ARTD-002.731.17, Safety rules for installation and maintenance. The legal national regulations apply to the subsidiaries. If no regulations exist, observe the following rules in the interest of safety for customers, patients, employees, other persons, and the company.

Initial measurement

The measurement was performed at the factory and the value measured was recorded in test protocol 1b. The measurement was performed with the line voltage and line frequency specified in the test protocol. During startup of the SIREMOBIL Compact on-site, the values were checked, remeasured and recorded to determine whether they deviate from the line voltage. The protocol is filed in Register 3 of the log book.

Repeat measurements

When performing service or repair work in the primary circuit of the power supply, the equivalent device leakage current must be measured again and compared with the initial value measured. The measurement setup must match the measurement setup for the equivalent leakage current / protocol. During measurement, the SIREMOBIL Compact must be switched on. When using the Bender safety tester, the tester must be set to manual measurement. The values measured during repeat tests may not exceed the original value by more than 50%. In addition, the limit of 2 mA cannot be exceeded. SIREMOBIL Compact systems which exceed this threshold must be serviced. The values measured are to be recorded in the equivalent device leakage current / protocol (refer to log book, Register 3).

Covers



Electrical voltage!
See Chapter 1, Safety Information.

Disconnect the line voltage plug prior to removing covers.

Basic system

Back cover

Removing the back cover

- Put on the foot brake.
- Remove the screws from the back cover.
- Pull the cover back approx. 25 cm.
- Unscrew the protective conductor from the cover.
- Pull the cover completely off and tilt it downward.
- Lift up the cover and raise both lateral metal brackets from the guide rails.

Installing the back cover

- Fit the lateral metal brackets back into the guide rail.
- Remount the protective conductor to the back cover.
- Lift the cover and push it forward. Be careful with the EMC spring contact.
- Replace the cover and tighten the screws.

Monitor trolley

Back covers

Removing the covers

- Remove the upper back cover plate of the log book compartment.
- Remove the protective conductor.
- Remove the lateral Allen screws from the lower back cover.
- Remove the protective conductor from the cover.

Installing the covers

- Begin with the lower back cover.
- Remount the protective conductor for the lower cover.
- Install the cover and tighten the screws.
- Remount the protective conductor for the Logbook cover.
- Install the cover and tighten the screws.

I.I. cover

- The cover for the image intensifier is secured by one screw.
- Insert the rubber lip in the groove prior to remounting the cover.
- When installing or deinstalling, handle the protective conductors with care.

I.I. mini power supply

- The control panel of the image intensifier mini voltage supply is accessible after removing the I.I. cover.
- The high voltage panel of the I.I. mini power supply is built into the C-arm (see Fig. 1).
- The cover (on the outside of the C-arm near the I.I.) is secured with two screws and can be removed from the rubber buffer of the I.I. After removing the cover, the high voltage panel is accessible.

SIREPHOS cover



The SIREPHOS cover has been sealed all around against contamination by dirt using a sealing compound (Part No. 20 49 716).

- Loosen the cover screws of the SIREPHOS cover.
- Use a sharp knife to cut open the sealing compound all around the cover.
- Lift off the SIREPHOS cover.
- Remove the sealing compound residue from the cover and from the SIREPHOS.
- On completing service, place the SIREPHOS cover on the SIREPHOS and seal it with sealing compound all around.
- Use a paper towel to wipe off excess sealing compound.
- Refasten the SIREPHOS cover with the cover screws.

Prerequisites 1 - 9

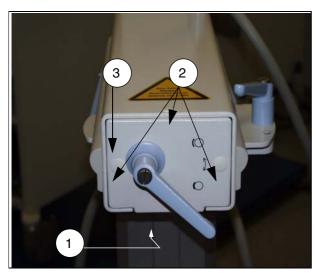
Back stop plate at the C-arm horizontal support

MWARNING

Risk of physical injury and damage to property!

When performing service work on the horizontal slide of the basic unit (for example, when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and drop onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.



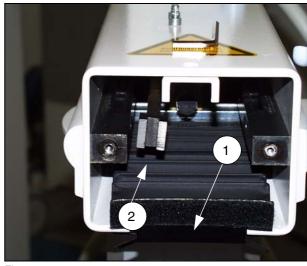


Fig. 2

Fig. 3

For work that requires removal of the end stop (see 3/Fig. 2), observe the warning above.

Removing the back stop plate

- Lock the horizontal brake.
- Remove the rubber cover (adhesive closure) underneath the horizontal support (see 1/Fig. 2 and 1/Fig. 3).
- Remove the caps (2/Fig. 2).
- Remove the three screws (2 / Fig. 2).
- Remove the back stop plate (3/Fig. 2). Pay attention to the coupling part set on the shaft of the handle mechanism (2/Fig. 3).

Installing the back stop plate

- Place the coupling part (2/Fig. 2) back on the shaft.
- Remount the back stop plate (3/Fig.1) and fasten it with the screws.
- Reinstall the rubber cover (1/Fig. 1) and close it (adhesive closure).
- Check the function of the horizontal brake.

Concluding steps

• After completing all work, perform the protective conductor test (see ARTD-002.731.17).

∆WARNING

Electrical voltage! See Chapter 1, Safety Information.

Disconnect the SIREMOBIL Compact line voltage plug.

- Open the back cover of the monitor trolley.
- Measure the on-site line voltage and line frequency.
- Adjust transformer T1 to the required line voltage and line frequency. Refer to the label on the switch-on assembly.
- Adjust transformer T2 to the required line voltage and line frequency. Refer to the label on the switch-on assembly.
- Check fuses F1 and F2 to see if they correspond with the values on the label of the switch-on assembly and replace them, if necessary.
- Mark the correct line voltage and line frequency on the line voltage label at the back of the monitor trolley.

Checking the line voltage on the monitor trolley

- Connector X10 for the basic system must be disconnected.
- The monitor, memory device and other devices, if present, such as multiformat camera, video printer or video recorder must be disconnected from the line voltage supply.
- Check the secondary voltages for line voltage transformer T1 according to Table 1.

	from test point	to test point	Voltage	Comment
	Transformer T1.31	Transformer T1.32	190 V ~ to 205 V ~	cannot be adjusted
	Transformer T1.31	Transformer T1.33	230 V ~ to 246 V ~	cannot be adjusted
	Line voltage cable Memoskop, N	Line voltage cable Memoskop, L	230 V ~ to 246 V ~	cannot be adjusted
	Line voltage cable Monitor 1, N	Line voltage cable Monitor 1, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Monitor 2, N	Line voltage cable Monitor 2, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Multispot, N	Line voltage cable Multispot, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Video printer, N	Line voltage cable Video printer, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Video recorder, N	Line voltage cable Video recorder, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Optical isolation line voltage cable, N	Optical isolation line L voltage cable	230 V ~ to 246 V ~	cannot be adjusted

Tab. 1

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Low voltages

Check the operating voltages for the SIREMOBIL Compact against the values in Table 1.

from test point	to test point	Voltage	Tolerance	Potentiometer
M14.4 (0V)	M14.5/6 (+5 V)	+ 5 V	<u>+</u> 0.2 V	M14. +5 V/Adj.
M14.3 (0V)	M14.2 (+15 V)	+ 15 V	<u>+</u> 0.1 V	M14. +15 V/Adj.
M14.3 (0V)	M14.1 (-15 V)	- 15 V	<u>+</u> 0.5 V	M1415 V/Adj.
D3.X8.1 (0V)	D3.X8.3 (+26,75 V)	+26.75 V	<u>+</u> 0.25 V	D3.R3
M13.S- (0V)	M13.S+ (+13 V)	+13 V	<u>+</u> 0.2 V	M13.TR1
D3.X1.7 (0V)	D3.X1.9 (+24 V)	+ 26.5 V to + 29.5 V	n.a.	not adjustable

Tab. 1

I.I. voltages



Electrical voltage! See Chapter 1, Safety Information.

Do not touch any part of the I.I. mini voltage supply!

The voltages E1 / E2 / E3 and A may be taken from the I.I. test protocol and checked or adjusted against the control test points listed in Table 2.

Voltage	Test point	Ground point (0V)	Potentiome- ter for full format	Potentio- meter for zoom format	Voltage divider ratio
E1	UE1		P10	P11	1:1
E2	UE2		P6	P7	1:1
E3	UI 15	<u></u>	P2	P3	1:10000
30 kV, Anode	UI 30	<u></u>	P1	P1	1:10000

Tab. 2

Checking the operating voltages

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Control board D1, Host

- Connect the service PC to the serial service interface on SIREMOBIL Compact.
- Start the service program.
- Insert the "Parameter" diskette in drive A.
- Select the Download menu and start the download (ARC / Fil. / Host).
- After the download has successfully been completed (1 minute), wait for the system to boot.
- The SIREMOBIL Compact is operational.

NOTE

If you cannot run download (e.g. power failure during download):

- Switch the SIREMOBIL Compact off and back on
- Restart download

Storage of the error log as ASCII file

If you store the error log using the backup function of the service program, the error log
will be stored as binary file and can't be read with a word editor.
 For easier evaluation of the error log, it is also possible to store it as an ASCII file.
 For easier service support from the USC or HSC, please send the error log as an ASCII
file.

NOTE

The parameter diskette must be in drive A before the start of the service program and during the service work. Without a parameter diskette in drive A, the short error messages will not be stored in the error log file and the text "no error text available" is stored behind the error codes.

Prerequisites:

The service PC is already connected, the service program is already started.

- Select the menu "Diagnostics...".
- Select the menu "Error log".
- Click on the button "Get from unit". Wait until the error log is transferred to the service PC.
- · Click on the button "Export to file".
- Select your hard disk drive for storage of the file.
- For the file name, please enter the current date, the part number and the serial number of the unit as described in the example.

Example: The current date is (DD-MM-YY): 29-03-01

The unit Part No. is: 37 76 494
The unit Serial No. is: 01234

Enter the file name: 22-03-01_37 76 494_01234.txt

- Store the file on the hard disk drive of the service PC to a path of your choice.
- Exit the service program.

Loading the operating software

• Copy the previously stored file to a formatted diskette.

Generator, kV offset adjustment

NOTE

The kV offset adjustment has to be followed by the generator adjustment (filament circuit learning program). Always perform the kV offset adjustment prior to beginning the generator adjustment.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Diagnostic menu.
- Select the Monitoring menu.
- Select "KV offset adjustment in the "Group 1" Combo box.
- Click on "Update Stop".



X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



 After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact hand switch.

NOTE

After the "KV error break" message in the STATUS line, click on "Update Stop". Wait for approx. 10 seconds. Click on "Update Start" again. After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact hand switch. Refer to the text which follows for additional procedures.

- Continue to hold the radiation release button as long as the message "Continue fluoro" is displayed in the ACTIONS line.
- Release the radiation release button as soon as the message "Stop monitoring" appears in the ACTIONS line.
- Click on "Update Stop".
- Perform the generator adjustment (filament circuit learning program).

Generator adjustment (filament circuit learning program)

NOTE

The kV offset adjustment must be performed prior to starting the generator adjustment.

NOTE

If an error occurs during the generator adjustment, switch OFF the SIREMOBIL Compact and perform the kV offset and generator adjustments again.

NOTE

As soon as the generator adjustment is started, press the radiation release button on the hand switch until the "Stop monitoring" message appears in the ACTIONS line. If you deactivate radiation too soon, the generator adjustment must be completely repeated. Exception: You can briefly stop pressing the radiation release button (less than 30 seconds) during the warmup phase (warmup displays in the STATUS line on the service PC) of the SIREPHOS. The generator adjustment continues when the radiation release button is pressed again.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Diagnostic menu.
- Select the Monitoring menu.
- In the "Group 1" Combo box, select "Generator adjustment".
- · Click on "Update Start".

⚠WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



- After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact hand switch.
- Continue to hold the radiation release button as long as the message "Continue fluoro" is displayed in the ACTIONS line.
- "Warmup" appears in the STATUS line, the Sirephos is warming up. After approx. 8 minutes, the message "learning pushfactor" will appear in the STATUS line.
- A maximum of 15 exposures will be released automatically.
- The message "Learning done" appears in the STATUS line after the generator adjustment has been successfully completed.
- The "Stop monitoring" message appears in the ACTIONS line.
- Activate the radiation release button.
- Click on "Update Stop".
- Switch the SIREMOBIL Compact OFF and back ON again.

Checking the generator adjustment

∆WARNING

X-ray radiation! See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

- With the system on, connect the service PC to the SIREMOBIL Compact.
- Select "Test..." in the Diagnostic menu.
- Select cassette simulation in "Function Groups".
- Select cassette switch ON in "Available Functions".
 The SIREMOBIL Compact is now in direct exposure mode.
- Select 81 kV with the kV+/kV-keys.
- Select 8 mAs with the mAs+ / mAs- keys.
- Connect oscilloscope channel 1 to D1.X46, ground at 0V.
 Set the sensitivity to 1 V / Div.
- Connect oscilloscope channel 2 to D1.X48, ground at 0 V.
 Set the sensitivity to 2.5 V / Div.
- Set the time to 25 ms / Div.
- Set the oscilloscope to storage mode.
- Release an exposure with the hand switch and store the oscillogram with the exposure.
- Evaluate the stored oscillograms.

The tube current must reach the tolerance range of $13 \, \text{mA} \pm 1.5 \, \text{mA}$ in the time of $3 \, \text{ms}$ and may not leave this range for the next $6 \, \text{ms}$ (the tube current may not run above $14.5 \, \text{mA}$ within the first $6 \, \text{ms}$).

Refer also to oscillograms in Fig. 1 / Fig. 1a and Fig. 1b.

- Select "Cassette switch off" on the service PC in "Available Functions".
 Direct exposure mode is cancelled.
- If the unit exceeds the tolerance range, the generator adjustment must be repeated.

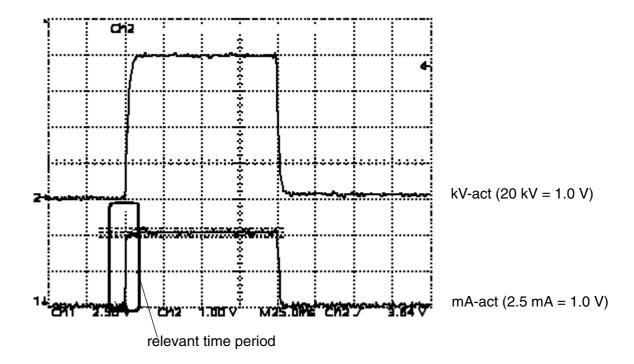


Fig. 1

Error examples:

Tube current exceeds the upper limit - preset filament current too high

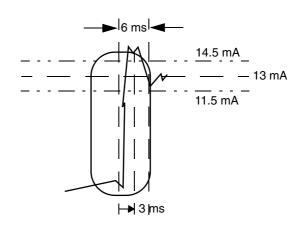


Fig. 1a

Tube current exceeds the lower limit - preset filament current too low

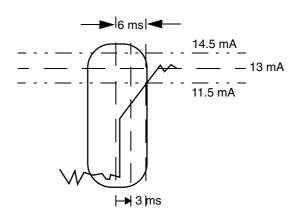


Fig. 1b

Dose rate adjustment

∆WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

• The "Adjustment mode" parameter in the "Doserate adjustment" parameter group has been programmed to "semi-automatic".

Preliminary steps

- Switch on SIREMOBIL Compact.
- Connect the service PC to the serial interface of the SIREMOBIL Compact.
- Start the service program.
- Select the "Diagnostics..." menu.
- Select the "Monitoring..." menu.
- Select the "Dose rate adjustment" menu from the Combo Box "Group 1".
- Click on the button "UPDATE START".
- The following is displayed on the service PC:

AUTO REGULATION indicates the current status of the automatic adjustment.

(active / not active / manual / done)

BRIGHTNESS DEVIATION shows the difference in the actual brightness value minus the

nominal brightness value.

CONTROL CURVE shows the currently selected fluoro curve (default: S2, antiiso-

watt 5 mA)

ADJUSTMENT shows the operating control mode.

(Generator / Camera Iris / Stop)

I.I. ZOOM STATUS shows the current I.I. format (survey / zoom)

DOSERATE shows the dose rate selected.

(LOW / MID / HIGH)

TV-IRIS NOMINAL VALUE shows the stored or nominal TV-iris value from the learning

phase.

Note: An offset value is added to this value.

For this reason, the TV-IRIS NOMINAL VALUE and TV-IRIS

ACTUAL VALUE differ despite the correct adjustment

(BRIGHTNESS DEVIATION 0 ± 3).

TV-IRIS ACTUAL VALUE shows the actual TV iris value.

• Insert 25 mm Al and 2.1 mm Cu at the radiation exit port of the SIREPHOS.

• The grid remains on the I.I.

Correction factors

- Grid correction factor 23 cm (9") I.I. and 17 cm (7") I.I.:1.5
- Dose measurement chamber correction factor for Dali and Nomex:1.06
- Multiply the Dose rate values to be set at the I.I. input screen with the Grid correction factor and if needed with the Dose measurement chamber correction factor.

Dose rate to be set at the I.I. input screen:

I.I. type	I.I. format	Dose rate		
		LOW	MID	HIGH
17 cm (7") I.I.	Survey	132 nGy/s	220 nGy/s	440 nGy/s
17 cm (7") I.I.	Zoom	187 nGy/s *	311 nGy/s	622 nGy/s
23 cm (9") I.I.	Survey	111 nGy/s	185 nGy/s	370 nGy/s
23 cm (9") I.I.	Zoom	157 nGy/s *	262 nGy/s	523 nGy/s

*NOTE

For LOW dose rate levels in zoom format:

Due to the maximum possible opening of the TV iris, deviating dose rate values are acceptable, if the dose rate level is set to LOW in zoom format.

When the dose rate level is set to LOW in the zoom format, the minimum position value (= minimum opening) of the TV iris may be the same value as in the survey format. (Opening of TV iris collimator in zoom format >= opening of TV iris collimator in survey format).

When the dose rate level is set to LOW in zoom format, the display "BRIGHTNESS DEVIATION" may show a value greater than \pm 3.

If the value shown in "BRIGHTNESS DEVIATION" is greater than \pm 3, you must read out and evaluate the position values of the TV iris collimator when the dose rate level is set to LOW in both the zoom and survey formats:

(Service PC, Menu Adjustments... / Parameters... / Doserate adjustment, Parameter LOW - Zoom format pos. and Parameter LOW Full format pos.)

Acceptable parameter values are:

LOW - Zoom format pos. >= LOW - Full format pos.

Unacceptable parameter values are:

LOW - Zoom format pos. < LOW - Full format pos.

Setting the dose rate for survey format

- Select the I.I. survey format (refer to the I.I. ZOOM STATUS).
- Center the dose measurement chamber on the I.I. input screen and attach.
- Use the key to select the dose rate (LOW / MID / HIGH, shown in the "DOSERATE" line).



- Apply fluoro briefly until the generator finishes regulating the automatic fluoro adjustment.
- Select KV STOP at the system operating console.
- Switch on fluoro.
- Set the dose rate with the [+kV] and [-kV] keys.
 (Dose rate * grid correction factor (* measurement chamber correction factor if needed)).
- The resulting KV value should be between 70 to 80kV. If necessary, change the prefiltration and set the dose rate again using keys [+kV] or [-kV]. Refer to the table.
- · Switch off fluoro.
- Remove the dose measurement chamber from the I.I. input screen.



- Switch on fluoro.
- Press the [>0<] at the system operating console. This starts the automatic adjustment procedure for the TV- iris collimator.
- Wait until the message "done" appears in the "AUTO REGULATION" line.
- The "BRIGHTNESS DEVIATION" value is shown in the "BRIGHTNESS DEVIATION" line and should be 0 + 3.
- · Switch off fluoro.

Setting the dose rate for zoom format

refer also to notice on previous page *.

- KV-STOP remains selected.
- Center the dose measurement chamber on the I.I. input screen and attach.
- Select the I.I. zoom format (refer to "I.I. ZOOM STATUS"). The KV values remain the same. The mA values, however, are automatically increased by a factor of 1.41.
- Use the [mA+] and [mA-] keys to set the dose rate for the zoom format (Dose rate *grid correction factor (* measurement chamber correction factor - if needed)).
- Press the [>0<] key at the system operating console. This starts the automatic adjustment procedure for the TV-iris collimator.
- Wait until the message "done" appears in the "AUTO REGULATION" line.
- The "BRIGHTNESS DEVIATION" value is shown in the "BRIGHTNESS DEVIATION" line and should be 0 ± 3, refer also to notice on previous page *.
- Switch off fluoro.

 Select the next level of dose rate (LOW / MID / HIGH) and repeat the dose rate setting for the survey and zoom format for this level.

Concluding steps

- After setting all dose rates for the survey and zoom formats, click "Stop Update" and wait until "CAL" disappears from the 7 segment indicator to the right on the operating console. The TV- iris collimator values are stored to the EE-PROM of the host.
- Press ESC at the service PC to return to the main menu.
- Select the "Data, Backup..." menu.
- Click "Parameter" in the backup window.
 - Then click "Backup" .
- Enter" dose rate set" under "Remarks for Parameter".
- Then click "OK". The parameters are stored to disk.
- You can now exit from the service program.

Checking the dose rate in automatic mode



Checking the dose rate in zoom format with a dose rate measurement chamber that is not completely irradiated may lead to incorrect measurements.

- Center and reattach the dose measurement chamber to the I.I. input screen.
- Set the kV-mA curve HC1 (3 mA plateau curve). If necessary, temporarily program the HC1 curve.



- During automatic mode (kV STOP is off), check the dose rate for dose rate levels LOW / MID / HIGH for the survey and zoom format. Take into account the correction factors for the grid and the dose measurement chamber. If necessary, temporarily change the dose rate levels and kV-mA curves.
 - Tolerance margin for the dose rates: \pm 15%.
- Set the kV-mA curve HC2 (5 mA plateau curve). If necessary, temporarily program the HC2 curve.



 During automatic mode (kV STOP is off), check the dose rate for dose rate levels LOW / MID / HIGH for the survey and zoom format. Take into account the correction factors for the grid and the dose measurement chamber. If necessary, temporarily change the dose rate levels and kV-mA curves.

Tolerance margin for the dose rates: + 15%.

Setting the maximum skin dose rate

∆WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

NOTE

Setting the maximum skin dose rate is necessary only for countries where DHHS regulations apply.

Prerequisites

- You must program one of the FL curves S2, HC2 or IODINE.
- The FL curves S2, HC2 or IODINE should be used for the following adjustment.
- The X-ray tube cover must be installed.
- Use the dose ionization chamber of the dose measurement device to measure dose rates greater than 10 R/min.
- If you are using an area dose product measurement device, mount the dose measurement chamber above the radiation exit port of the SIREPHOS.

Preparations

- Attach the dose ionization chamber at a distance of 30 cm from the I.I. housing (Fig. 2).
- Select one of the FL curves S2 / HC2 or IODINE according to the programming. (Push-key)



- Briefly release fluoro.
- Select kV stop mode and enter 110 kV (5 mA).

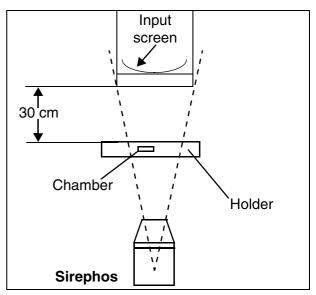


Fig. 2

NOTE

If the maximum tube current was already reduced, the mA value displayed at 110 kV should be recorded and used for the calculation. The maximum skin dose rate to be set should equal 9 R/min.

Measurement



- Switch on fluoroscopy.
- Read and record the value displayed on the dose rate meter.
- If the value measured exceeds 9 R/min, the maximum tube current must be reduced. If the value measured is less than 9 R/min, the tube current does not need to be reduced.
- Switch fluoroscopy off.
- Calculate the maximum tube current.

tube current displayed at 110kV in mA * 9 R/min = tube current to be programmed in mA measured dose rate value in R/min

• Multiply the tube current to be programmed by 10, since entry on the service PC must be made in 1/10mA. Round off the value to the nearest whole number.

Example: Tube current displayed at 110kV: 5mA

Maximum skin dose rate: 9R/min
Measured dose rate value: 10.2 R/min.

 $\frac{5 \text{ (mA)} * 9 \text{ (R/min)}}{10.2 \text{ (R/min)}} = 4.41 \text{ (mA)}$ Rounded to the nearest whole number: 44

The value to be programmed is 44

Programming

- Connect the service PC to the serial interface of board D1.
- Select the "Adjustment, Parameters" menu.
- In the Combo box "Parameter Groups" select "Limitation of skin dose rate (FL)".
- Click on "Get from unit".
- Enter the value to be programmed in "Value".
- Click on "Set Value".
- Select "Put to unit" . Read the menu guide on the service PC.
- Select "Save to file".
- The value to be programmed has been transferred to the SIREMOBIL Compact and temporarily stored to the disk.

NOTE

You must exit the service program with "Logoff" and "Quit". Only then will the modified parameters be stored on the floppy disk as a new file.

Checking



• After programming, check the maximum skin dose rate again.

Collimator, X-Iris

NOTE

Because of the mechanical hysteresis of the semi-transparent slot diaphragm, open the collimator blades to maximum aperture, prior to adjusting the radiation iris.

∆WARNING

X-ray radiation! See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

- Attach the center cross in the center of the image intensifier input screen.
- Connect the service PC to the serial interface on board D1.
- Start the service program.

Adjustments

- Select the "Adjustment, Calibration" menu.
- · Answer the query with "yes".
- Select "X-Iris" in the "Function Groups" combo box.
- In the window "Available Functions:" select "1. Init (Limits Off / Autosearch)" and click on Execute.
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- The X-Iris can now be completely opened and closed with the X-Iris keys.



- Select I.I. survey format.
- During fluoroscopy, adjust the X-Iris by opening and closing it with the X-Iris keys so that the collimator blades are still visible along the edge of the I.I.
- · Stop fluoroscopy.
- Select "2. II. Full Format Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- · Switch to zoom format.



- During fluoroscopy, adjust the X-Iris by opening and closing the X-Iris keys so that the collimator blades are still visible along the edge of the I.I.
- Stop fluoroscopy.
- Select "3. II. Zoom Format Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- Open the X-Iris completely.
- Select "4. CEX Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- Close the X-Iris completely.



- Release fluoroscopy. The X-Iris must close between 4 4.5 cm.
- Stop fluoroscopy.
- Select "5. CLOSED POSITION" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the guery "Do you want to reset the unit," click "NO".
- Select "8. Init Off & Store Positions" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "Yes".
- Switch the SIREMOBIL Compact OFF and ON.



- Check the X-Iris again in survey format and zoom format. The collimator blades must still be visible on the edge of the image. If necessary, repeat the adjustment.
- Stop fluoroscopy.

Concluding steps

- Return to the main menu on the service PC with the ESC key.
- · Select the Data, Backup... menu.
- Select Parameter in the backup window.
- Click on "Backup". At "Remarks for Parameter" enter "X-Iris set".

- Click on "OK". The new position values for the collimator will be stored on the disk.
- Return to the main menu with the ESC key.

Collimator, slot diaphragm

Prerequisites

- Camera rotation has been adjusted correctly.
- Image reversal functions are disabled.
- The "SLOT DIAPHRAGM," "TYPE OF DIAPHRAGM" parameter has been programmed for "DISPLAY YES".

Adjustment

- Connect the service PC to the serial service interface.
- Start the service program.
- Select the Adjustment, Calibrations...menu.
- Respond to the query with yes.
- In the Combo box "Function Groups:" select "Slot Diaphragm".
- In the window "Available Functions:" select "Disable circle mask" and click "Execute. The circle mask of the Memoskop is switched off.
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No".
- In the window "Available Functions:" select "Init" and the "Execute".
- Close the status window by clicking on the OK button.
- Respond to the guery "Do you want to reset the unit" by clicking "No".
- The mechanical limits are checked and the position values are automatically stored.
- Camera rotation is automatically moved to the 0 degree position.
- The X-Iris is opened to max.aperture.
- Switch off Zoom.
- Attach a centering cross or equivalent object to the I.I. for evaluating the position of the fluoro image



X-ray radiation! See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



- Switch on fluoro
- Move the slot diaphragm to the 0 degree position using the keys for rotating the slot diaphragm. The blades should be in the vertical on the monitor screen.
- Switch off fluoro.
- In the window "Available Functions:" select "0 DEGREE POSITION" and click "Execute".

Close the status window by clicking on the OK button.



- Respond to the query "Do you want to reset the unit" by clicking "No".
- Switch on fluoro.
- Open the slot diaphragm to where the blades begin to disappear at the edge of the image.
- Switch off fluoro.
- In the window "Available Functions:" select "FULL FORMAT POSITION" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No".
- Select the zoom format.
 - · Switch on fluoro.
 - Open the slot diaphragm to where the blades begin to disappear at the edge of the image.
 - Switch off fluoro.
 - In the window "Available Functions:" select "ZOOM FORMAT POSITION" and click "Execute".
 - Close the status window by clicking on the OK button.
 - Respond to the query "Do you want to reset the unit" by clicking "No".
 - In the window "Available Functions:" select "Enable circle mask" and click "Execute"
 - Respond to the query "Do you want to reset the unit" by clicking "No".
 - In the window "Available Functions:" select "INIT OFF & STORE POSITION" and click "Execute".
 - Close the status window by clicking on the OK button.
 - Respond to the query "Do you want to reset the unit" by clicking "Yes". The adjustment values are stored.

Concluding steps

- Switch off the system and switch it back on again.
- Return to the main menu by pressing ESC at the service PC.
- Select the "Data, Backup..." menu.
- Click "parameter" in the Backup window.
- Then click "Backup". Enter "slot diaphragm adjusted" under "Remarks for Parameter".
- Then click "OK". The new position values are stored to disk.
- You can now exit from the service program.

Collimator displays on the monitor

Prerequisites

• Camera rotation, collimators for X-Iris and slot diaphragm have been set correctly.



X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Collimator display, X-Iris

- Connect the service PC to the serial interface of the SIREMOBIL.
- Start the service program.
- Select the "Adjustment, Calibrations..." menu.
- Respond to the guery with "Yes".
- Select "Screen Display Collimator" in the "Function Groups:" combo box.

Start adjustment

• In the "Available Functions:" window select "Init" and click on "Execute". The X-Iris is automatically opened to full format and the slot diaphragm is opened to maximum aperture.

Full format, X-Iris open

- Zoom must be disabled.
- Release fluoro and wait until generator has performed automatic adjustment.
- Switch fluoro off. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-iris.
- In the "Available Functions:" window select "Open Pos II. Full Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "No". The X-Iris is automatically closed to the smallest format.

Full format, X-Iris closed



- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-Iris.
- In the "Available Functions:" window select "Close Pos II. Full Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "No".

- The X-Iris remains in the minimum position.
- Zoom format is automatically selected.

Zoom format, X-Iris closed



- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-Iris.
- In the "Available Functions:" window select "Close Pos II. Zoom Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit" click on "No".
- The X-Iris is opened automatically.
- Zoom format remains selected.

Zoom format, X-Iris open



- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-Iris.
- In the "Available Functions:" window select "Open Pos II. Zoom Format and click on "Execute".
- Close the status window by clicking on the OK button.
- For the guery "Do you want to reset the unit", click on "No".

Save values and end adjustment

- In the "Available Functions:" window select "INIT OFF & STORE VALUES" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "Yes".

Concluding tasks

Before ending the service program, save the new parameter values to disk (Service PC, Data menu, Backup).

Slot diaphragm

NOTE

Use the lowest KV values possible to ensure optimal detection of the front edges of the slot diaphragm blades.

Prerequisites

- The setting of the camera rotation is correctly adjusted and is in the 0° position.
- Connect the service PC to the serial interface of the SIREMOBIL.
- Start the service program.
- Select the "Adjustments, Calibrations..." menu. Answer the query with "Yes".
- Select "SCREEN DISPLAY SLOT DIAPHRAGM" in the "Function Groups:" combo box.

Disable circle mask

- Switch off zoom.
- In the "Available Functions:" window, select "DISABLE CIRCLE MASK" and click on "Execute". Close the status window by clicking on the OK button.
 For the query "Do you want to reset the Unit", click on "No".

Start adjustment

In the "Available Functions:" window select "INIT" and click on "Execute". Close the status window by clicking on the OK button.
 For the query "Do you want to reset the Unit", click on "No".

Full format, slot diaphragm open

Move the camera into the 0 degree position.
 The X-Iris opens to survey format. To open it further, use the keys for opening the X-Iris.
 The slot diaphragm is opened automatically.



- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Open Pos I.I. Full Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm is closed automatically.

Full format, slot diaphragm closed



- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Close Pos I.I. Full Format" and click "Execute".
- Close the status window by clicking on the OK button.

 Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm remains closed.

Zoom format, slot diaphragm closed

- The zoom format is selected automatically.
- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Close Pos I.I. Zoom Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm opens automatically (zoom format).

Zoom format, slot diaphragm open



- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Open Pos I.I. Zoom Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No".

Enable circle mask

In the "Available Functions:" window select "Enable Circle Mask" and click on "Execute".
 Close the status window by clicking on the OK button.
 For the query "Do you want to reset the unit", click on "No".

Save values and end adjustment

 In the "Available Functions:" window select "INIT OFF & STORE VALUES" and click on "Execute". Close the status window by clicking on the "OK" button.
 For the query "Do you want to reset the Unit", click on "Yes".

Concluding tasks

 Before exiting the service program, save the new parameter values to disk (Service PC, Data menu, Backup).

Correction of the 0° position of the slot diaphragm display

NOTE

Correct only if the slot diaphragms are shown at an angle of rotation different from that displayed on the monitor. A correction of $\pm\,10^\circ$ is possible. Camera rotation and slot diaphragm have to be set correctly.

The service PC is connected to the serial interface of the SIREMOBIL Compact.

The service program is started.

- Select the "Adjustments," "Parameter" menu at the service PC.
- Select "Screen display Slot diaphragm" in the Combo box.
- · Click "Get from Unit".
- Select "Rotation 0 degree position".
- The parameter in the "Value Actual" field can be changed according to the minimum and maximum values.
- Then click "Set Value".
- Click "Put to Unit".



- After the SIREMOBIL Compact has booted, compare the 0° position of the slot diaphragm blades to the display on the monitor. If necessary, repeat the programming.
- · Click "Save to file".
- Leave the service program with "Logoff" and "Quit" to save the parameters as a new file to disk.

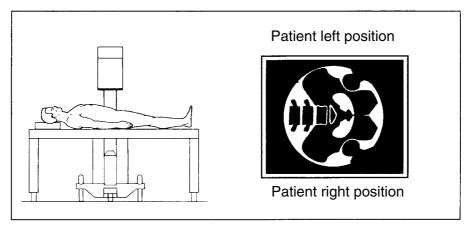
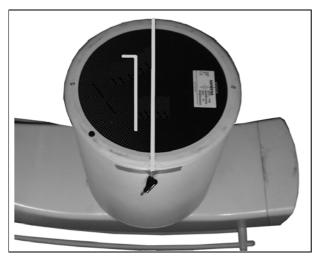


Fig. 3



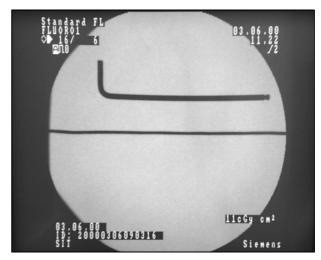


Fig. 4

Fig. 5

Camera rotation

∆WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

NOTE

The keys for horizontal and vertical image reversal must be off prior to adjusting camera rotation. Camera rotation should be set in the 0° position. Fig. 3, Fig. 4 and Fig. 5 show the 0° position.

NOTE

With the right camera rotation key (the arrow on the key is pointing clockwise), the marker on the monitor will rotate clockwise. The image contents will rotate counterclockwise.

With the left camera rotation key (the arrow on the key is pointing counterclockwise), the marker superimposed on the monitor will rotate counterclockwise. The image contents will rotate clockwise.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Adjustment, Calibrations menu.
- Answer the query "yes".
- In the Combo box "Function Groups:" select "Camera Rotation".
- In the window "Available Functions:" select "1. Init (Disable Limits)" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".
- Attach the center cross or equivalent to the image intensifier.



- Start fluoro and rotate the camera to the +180° position (with the counterclockwise camera rotation key). The image contents should rotate counterclockwise.
- Stop fluoro. In the window "Available Functions:," select "2. +180 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".



- Start fluoro and set camera rotation to the 0° position. The image (left/right / up/down) corresponds to Fig. 3.
- Stop fluoro, in the window "Available Functions:," select "3. 0 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the guery "Do you want to reset the Unit," click "No".



- Start fluoro and rotate the camera to the -180° position (with the counterclockwise camera rotation key). The image contents will rotate clockwise.
- Stop fluoro, in the window "Available Functions:," select "4. -180 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".
- In the window "Available Functions:", select "5. Init Off & Store Positions" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit", click "Yes".
- Return to the service program main menu with the ESC key.
- Select the Data, Backup... menu.
- Select Parameter in the Backup window.
- Click on "Backup".
- In "Remarks for Parameter", enter "camera rotation set".
- Click "OK". The new position values for camera rotation will be stored to the disk.



Switch the SIREMOBIL Compact OFF and ON again.

• Check the adjustments again. In the 0° position, the object image must correspond to the one in Fig. 3.

Calibrating the area dose product measurement device

NOTE

This adjustment is used to calibrate the area dose product measurement device of the SIREMOBIL Compact display.

Calculating the CONSTANT parameter (Qt * Kg)

- Read and record the Kg value shown on the electronics unit of the area dose product measurement device.
- Read the Qt value on the dose chamber of the area dose product measurement device.
- Multiply these values and record them. The resulting value is the CONSTANT (QT*Kg) value to be programmed.

Programming

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Adjustment, Parameter menu.
- In the Combo box "Parameter Groups", select "Diamentor".
- Click on "Get from Unit".
- The Parameter "1. Diamentor Existing" must be on YES.
- Select parameter "2. Constant (Qt * Kg)".
- In "Value Actual:" field, enter the parameter you have calculated.
- Click on "Set Value".
- Click on "Put to Unit".
- Click on "Save to File".

NOTE

You must exit the service program with "Logoff" and "Quit" to store the modified parameters to disk as a new file.

Checking the programmed values

NOTE

Checking the programmed values will activate the self-test in the electronic system of the area dose product measurement device. This serves to recalibrate the electronic system of the area dose measurement device.

Prerequisites

The Qt * Kg value was checked and is programmed. Refer to Programming.

• Connect the service PC to the serial interface on board D1.

- Start the service program.
- Select the Adjustment, Calibrations menu.
- Click "Yes" to answer the query.
- In the Combo box "Function Group:," select "Diamentor".
- In the window "Available Functions", select the line "Start Diamentor Test" and click on "Execute".
- Close the status window by clicking on the OK button.
- Respond the query "Do you want to reset the unit" by clicking "No".
- Press the -0- key (reset key for fluoroscopic time).
- The tested Qt*Kg value is displayed on the monitor of the SIREMOBIL Compact.
- This value must match the programmed CONSTANT (Qt*Kg) value.
 Tolerance: ±5%.
- By pressing the -0- key (reset key for fluoroscopic time) the test is repeated and is displayed again on the monitor.
- The potentiometer CAL on the electronic system of the area dose product measurement device can be used to adjust the test value to the calculated and programmed Qt*Kg value.
- After the adjustment, select "Stop Diamentor Test" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- Respond the query "Do you want to reset the unit" by clicking "No".
- The test is ended.
- Check the accuracy of the area dose product measurement device. Refer to the next section.

Checking the accuracy of the area dose product measurement device



X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

The calibration of the area dose product measurement device has already been performed.

Preparations

- Attach and center the center cross on the I.I. (Fig. 6).
- Select survey format.
- Select KV mA curve plateau HC1.



Release fluoroscopy briefly, adjusting the iris on the radiation field to a format of approx.
 8 cm.

NOTE

The radiation field must cover the entire area of the dose measurement chamber.

- Do not make any further adjustments to the iris.
- Record the diameter (Fig. 8) of the octagonal area of the radiation field.
- Remove the center cross.
- Attach and center the small (1cm³) dose measurement chamber of the dose measurement device onto the image intensifier (Fig. 7).
- Release fluoroscopy briefly. The radiation field must cover the entire area of the dose measurement chamber.



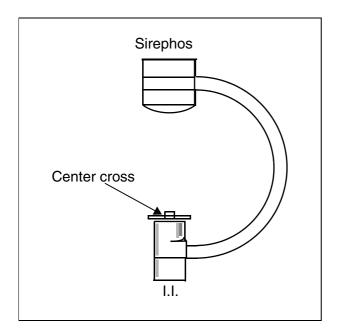
Select kV STOP and enter 70 kV.

Dose measurement

- Press the >0< key twice to reset the area dose product on the SIREMOBIL monitor to 0.
- Reset the dose measurement device to 0.
- Release fluoroscopy for approx. 5 seconds. The measured dose K_E should be high
 enough that the uppermost measurement range of the dose measurement device
 (Dali, Nomex...) is utilized fully. If necessary, reset the area dose product display on the
 Siremobil and the dose measurement device and repeat the measurement with a different fluoroscopic time.
- Record the measured dose.
- Record the area dose product displayed on the Siremobil monitor (FDPa).

Calculating the area dose product

 To calculate the measured area dose product: (measured area dose product FDPg) = (measured dose K_E) * (diameter)² * 0.829.



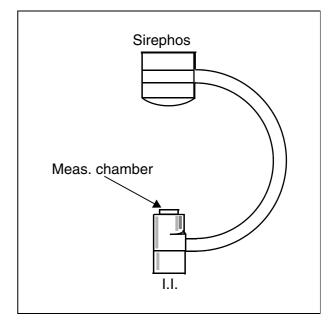


Fig. 6

Fig. 7

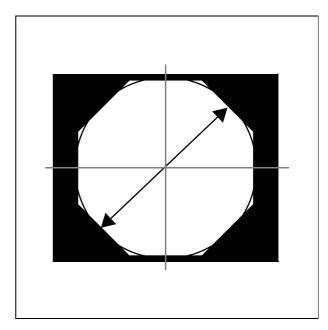


Fig. 8

Evaluation

Calculate the deviation between the measured area dose product and the displayed areadose product:

The deviation must be < 0.3.

Deviation = [(displayed area dose product FDPa) - (measured area dose product FDPg)] / (measured area dose product FDPg)

For deviations > 0.3, the area dose product measurement device must be replaced.

Overview of SIREMOBIL Compact parameters

Invoke the Moreinfo.hlp help file on the service PC for a short description of the parameters available on the SIREMOBIL Compact.

NOTE

If parameters have been changed and saved in the "Adjustments, Parameter" menu with Save to file, you must exit the service program with "Logoff" and "Quit" to save the modified parameters to the diskette.

Overview of MEMOSKOP C / C-E / C-SUB parameters

User Setup

- The User Setup is invoked with the CTRL + U key combination.
- The available functions are described in the SIREMOBIL Compact Operating Instructions.

Technical Setup

- The technical setup is invoked with the CTRL + T key combination.
- Enter the password and confirm with [RETURN]

The following functions can be invoked depending on the type of MEMOSKOP:

Function:	Comments:
Test pattern generation	Not for service, invoke the necessary test images on the service PC.
Video frequency	The currently programmed frame rate is shown in the parentheses to the right. After downloading the MEMOSKOP or after replacement, the MEMOSKOP will start up at the default video frequency (50 Hz). If the monitors are configured for a different video frequency, you must perform "blind" configuration for the correct video frequency. Refer to Configuring video frequency.
Number of monitors	Allows you to program the number of monitors used (1 or 2).
Hardcopy setup	You can configure the connection for hardcopy cameras. Check whether 5000 is programmed for "4 Max Hardcopy time" and if not, program this value.
Edge 1 coef set	Allows configuration of edge enhancement. Check whether 3 is programmed and if not, program this value.
Edge 2 coef set	Allows Configuration of edge enhancement. Check whether 8 is programmed and if not, program this value.
Motion detection setup	Configures the motion detector. Check if at MD 1: Threshold 100 and at MD 2: Threshold 120 is programmed, if not, program these values.
Circle mask setup	Allows you to configure the diameter of the circle mask.

Function:	Comments:
-----------	-----------

Move text positions Allows you to configure the position of superimposed text.

Date / Time format European: TT MM JJ / HH MM

US: MM DD YY / HH MM

System configuration Allows you to read out the current Memoskop configura-

tion.

Keyboard Allows you to program the corresponding keyboard layout

Universal / Roman / English.

Graphics level Level (brightness) of superimposed text.

(Default: 128)

Display of real time

clock

Yes: Real time clock (date and time) are displayed depending on the User setup programming for MEMOSKOP. The real time clock is active.

NO: The real time clock is switched off. The User setup

programming will not affect it.

Display of rotated

images

Yes: By pressing the image rotation key, the current

image will be recalculated and displayed.

NO: The rotated image will not be recalculated by pressing the image rotation key. For SIREMOBIL Compact

always set to YES.

Monitor zoom Yes: When pressing the key for MEMOSKOP - Zoom,

the image will be displayed enlarged.

NO: The MEMOSKOP - Zoom key has no function.

For SIREMOBIL Compact set to NO.

Monitor split Yes: Horizontal or vertical image split possible.

No: No horizontal or vertical image split possible.

Program Yes.

Monitor text Yes: Superimposes text.

No: No text superimposition.

For SIREMOBIL Compact always set to Yes.

Maximum image numbers The number of stored images can be programmed.

Program the value to 700 for MEMOSKOP C and to 900 for MEMOSKOP SUB. For MEMOSKOP C-E 100 program the value to 100. For MEMOSKOP CE, this parameter is

not used.

Product name Allows you to change the MEMOSKOP name, displayed

during system booting.

Do not change this for SIREMOBIL Compact!

Diagnostics Allows you to invoke test routines for repair by the manu-

facturer of the MEMOSKOP.

The MEMOSKOP can be reset via "Load factory default," as required. Subsequently you have to program accordingly. The same applies if you replace the MEMOSKOP.

Function: Comments:

Create External disk (1) MEMOSKOP CE and MEMOSKOP CE-100:
Program the value to "No".

All other types of MEMOSKOP:

If a MOD drive is implemented and/or the option DICOM

Bridge is installed, program the value to "Yes".

Enable Bridge (1) MEMOSKOP CE and MEMOSKOP CE-100:

Program the value to "No". All other types of MEMOSKOP:

If a MOD drive is implemented and/or the option DICOM

Bridge is installed, program the value to "Yes".

Default programs change-

able

Default: Yes

The organ programs can be protected against changes by

setting "No".

Default LUT After switch-on, the programmed brightness/contrast

curve (LUT) is selected automatically.

Default: LUT 2

Default LUT for Subtraction After switch-on, the programmed brightness/contrast

curve (LUT) is selected automatically for the subtraction mode, when equipped with a MEMOSKOP C-SUB.

Default: LUT 1

Default Edge After switch-on, the programmed edge enhancement is

selected automatically. Default: Edge 1

Software backward compa-

tible

Not implemented "Must be set to No".

Unit serial number Enter the serial number of the SIREMOBIL Compact if it is

equipped with a Dicom bridge. The serial number is required for identifying the images transferred. Please note that you have to omit the leading 0 when entering the

serial number.

Disable doserate selection

in user Setup

Set to "Yes" for SIREMOBIL Compact without an area

dose product measurement device.

Set to "No" for SIREMOBIL Compact with an area dose

product measurement device.

Subtraction K-factor,

phase A

Noise suppression, phase A, is programmed in the SUB-

mode.

Phase A: Mask acquisition.

Subtraction K-factor,

phase B

Noise suppression, phase B, is programmed in the SUB

mode.

Phase B: Acquisition of fill image.

Subtraction Time of phase A The time of phase A in the SUB-mode is programmed.

Phase A: Mask acquisition.

Roadmap K-factor, phase A Noise suppression, phase A, is programmed in the road-

map mode.

Phase A: Mask acquisition.

(1) in menu Diagnostics

Function:	Comments:
Roadmap K-factor, phase B	Noise suppression, phase B, is programmed in the road- map mode. Phase B: Acquisition of fill images.
Roadmap K-factor, phase C	Noise suppression, phase C, is programmed in the roadmap mode. Phase C: Acquisition of roadmap images.
Roadmap Time of phase A	The time of phase A in the roadmap mode is programmed. Phase A: Mask acquisition.

Configuring the MEMOSKOP

MEMOSKOP C-E, keyboard emulation

There is no keyboard supplied with some SIREMOBIL Compact units and installed MEMOSKOP C-E. When replacing the MEMOSKOP C-E or when changing the configuration, the MEMOSKOP service program should be used.

The help file "C-DATA.hlp" will be copied to the service PC during installation of the MEMOSKOP service program. The "C-DATA.hlp" help file contains descriptions of the programming.

Configuring the video frequency

After replacing the MEMOSKOP, it will start at a default video frequency (50 Hz). If the monitors were configured for a different frequency, you will have to configure the correct video frequency without a "visible image".

With out installed MEMOSKOP keyboard:

• Use the MEMOSKOP service program to modify the configuration.

With installed keyboard proceed with the steps described below:

- Invoke Technical Setup on Memoskop (press the CTRL + T keys.)
- Press the "2" key and press return. The video frequency menu is selected.
- Depending on the required video frequency, press the right cursor key "->".

"->" pressed 1 time: 60 Hz video frequency
"->" pressed 2 times: 100 Hz video frequency
"->" pressed 3 times: 120 Hz video frequency
"->" pressed 4 times: 50 Hz video frequency.

[&]quot;->" = Press the right cursor key

[&]quot;<-" = Press the left cursor key.

Key "->":	(Start)	"->"	"->"	"->"	"->"	
Video frequency	50 Hz	60 Hz	100 Hz	120 Hz	50 Hz	etc
Key "<-":	"<-"	"<-"	"<-"	"<-"	"<-"	"<-"

After selecting the desired video frequency, press "Return".

This configures the video frequency you have just selected.

After switching the SIREMOBIL OFF and ON again, the MEMOSKOP will start up at the correct video frequency.

MEMOSKOP, configuration for the number of existing monitors

When you replace the MEMOSKOP, it will be configured for 2 monitors.

This configuration displays USER SETUP and TECHNICAL SETUP on the second monitor.

Therefore, USER SETUP and TECHNICAL SETUP are not visible for SIREMOBIL Compact systems with only one monitor.

Without installed MEMOSKOP keyboard.

• Use the MEMOSKOP service program to modify the configuration.

With installed MEMOSKOP keyboard proceed as follows:

- Switch the SIREMOBIL Compact on.
- On the MEMOSKOP, reconnect the video cable from OUT 1 to OUT 2.
- Press CTRL + T at the same time on the MEMOSKOP keyboard;
 TECHNICAL SETUP is called up and is now visible on the monitor.
- Call up the menu "Number of monitors" by pressing the "3" key and subsequently the "RETURN" key on the MEMOSKOP keyboard.
- With the -> and <- cursor keys, set the number to 1 monitor and press the "RETURN" key. The text display disappears on the monitor.
- Press the "RETURN" key once more.
- Reconnect the monitor to the OUT 1 video output.
 The text display is now visible on the monitor.
- Exit TECHNICAL SETUP by pressing the "HOME" key on the MEMOSKOP keyboard.

MEMOSKOP, configuration and country-specific language (User Setup)

Start the program and transfer the country-specific language to SIREMOBIL Compact via the service PC.

Control board D1

∆WARNING

Electrical voltage!
See Chapter 1, Safety Information.

Make sure that LED V400 on board D2 is off prior to performing any work on boards D1 and D2. This should occur approximately 3 minutes after switching the SIREMOBIL Compact OFF.

- Disconnect board D1 completely.
- Replace board D1.
- Reconnect all cable connections.
- Be sure that the shielding and ground connections are seated correctly.
- Set the jumpers and switches according to the circuit diagram.
- Perform the download procedure for control board D1 (Host/Arc/Fil.).

NOTE

In case the EE-PROM of the replacement D1 is not completely deleted, it will be automatically cleared after the host software has been downloaded.

The delete procedure is indicated as "d" on the 7 segment display and requires approximately 5 minutes.

During the delete procedure, do not switch off the system or perform additional programming.

After successful deletion, the 7 segment display will return to normal status display.

- After download, wait 1 minute until the system has rebooted.
- Load the system parameters onto board D1.
 (Select DATA menu, RESTORE Parameter and click Restore.)
- Perform the kV offset adjustment.
- Perform the generator adjustment (filament circuit learning program).
- Check the dose rate control and adjust it if necessary.
- Ensure that the camera rotation is functioning properly. Adjust if necessary.
- Ensure that the collimator is functioning properly. Adjust if necessary.
- Check the display functions and setting of the blades on the monitor. Adjust if necessary.
- Ensure that the area dose product measurement device (where present) is functioning correctly.
- Ensure that the laser targeting device (where present) is functioning properly.
- Test the FL/PFL/DR and direct exposure functions of the SIREMOBIL Compact.

Power board D2

MARNING

Electrical voltage!

See Chapter 1, Safety Information.

Make sure that LED V400 is off prior to performing any work on boards D1 and D2. This should occur approximately 3 minutes after switching the SIREMOBIL Compact OFF.

- Disconnect boards D1 and D2 completely.
- Disconnect the cables between boards D1 and D2.
- Remove board D1 and D2.
- Apply heat conducting paste to the heat sink for the power semiconductor on the new D2 board.
- Reinstall board D2 and D1 and reattach all connections.
- Ensure that the shielding and ground connections are positioned correctly.
- Perform the kV offset adjustment and the generator adjustment (filament learning).
- Test the FL/PFL/DR and direct exposure functions (if there is a cassette holder).

Interface board D3



Electrical voltage!

See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace interface board D3.
- Check the +26.75 V voltage for the I.I. mini voltage supply. Adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.
- Check the radiation release / format switch over / vertical column travel functions.

D40 board for downward travel of the lifting column, Compact L only



Electrical voltage!

See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the D40 board.
- Using the operating instructions for the basic system, check both the movements of the C-arm and the signal messages.

VIDEOMED DC

- Set the camera rotation to the 0° position and mark the position of the VIDEOMED DC relative to the rotating I.I. optics.
- Switch the system OFF and wait approximately 3 minutes for the anode voltage of the I.I. mini voltage supply to drop.
- Disconnect the I.I. anode cable from the I.I. mini voltage supply.
- Make sure to short out the residual charge to ground.
- Ensure the correct high tension cable lengths by marking the position of the mounting cap nut on the anode cable with a colored pencil or electrical tape.
- Remove the O-ring and the cap nut from the anode cable.
- Disconnect the cable from the VIDEOMED DC and the Compact optics.
- Cut the cable ties securing the cable.
- Replace the VIDEOMED DC. Ensure that the VIDEOMED DC is at the 0° position relative to the rotating I.I. optics.
- Reconnect the VIDEOMED DC Compact optic cable and secure it with a cable tie.
 Make sure that the cable does not protrude past the edge of the board. It must lie in the recess of the VIDEOMED DC board.
- Reroute the anode cable to the I.I. mini voltage supply.
- Reinstall the cap nut (as marked).
- Reinstall the O-ring.
- The distance from the cap nut to the beginning of the white insulation of the anode cable should be 70 mm.
- Reconnect the anode cable and secure it.
- Check the camera rotation and adjust it if necessary.
 The camera should rotate + 220° + 3° or 220° -3° (check this using the display).
- Check the dose rate and adjust it if necessary.
- Check the image sharpness with the IQ Quick test and, if necessary, adjust it at the I.I. optics.
- · Perform the IQ Quick test.

Power supply M14, +5 V / +15 V / -15 V



Electrical voltage!

See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the power supply.
- Check the power supply voltage and adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.

Power supply M13, +12.3 V VIDEOMED DC

∆WARNING

Electrical voltage! See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the power supply.
- Check the power supply voltage and adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.

I.I. mini voltage supply

∆WARNING

Electrical voltage! See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

- Replace the control panel of the I.I. mini voltage supply (installed above Videomed DC).
- Replace the high voltage panel of the I.I. mini voltage supply.
 (Mounted on the C-arm, accessible after removing the cover near the I.I., on the outer edge of the C-arm. Refer to Chapter 1, "Information regarding this document").
- Refer to the I.I. test protocol for the voltages E1 / E2 / E3 and A. Check and adjust them, if necessary, according to Chapter 3, "Checking the operating voltages".
- Check the functions and adjustments of the collimator. Readjust if necessary.
- Check the display functions and setting of the blades on the monitor. Adjust if necessary.
- Check the overall resolution according to the IQ Quick test.
- Perform the IQ Quick test.

Collimator

- Replace the collimator.
- Ensure that the collimator is functioning properly and is set correctly. Adjust it if necessary.
- Ensure that the collimator blades of the iris diaphragm are visible during fluoroscopy in survey format and zoom format on at least two sides of the monitor image.
- Check the collimation for direct exposure if a cassette holder is being used.
- Check the display of the blades on the monitor and adjust if necessary.
- Remove the old set of collimator labels near the SIREPHOS and attach the new labels included in the same position.
 Check that the original collimator labels are the same as the new ones.

SIREPHOS

- Open the SIREPHOS cover (see Chapter 1, "Covers").
- · Remove the laser targeting device, if present.
- Remove the dose measurement chamber, if present.
- Remove the collimator.
- Disconnect the SIREPHOS plug.
- Remove the ground screw for the protective conductor.
- Remove the rubber stop of the C-arm on the SIREPHOS side. The screws that secure the SIREPHOS are now visible.
- Remove the SIREPHOS screws. When doing this, have a second person hold the X-ray tube unit.
- Place the new X-ray tube unit on the guide bolts and secure it with both Allen screws.
- Ensure that all cables are routed properly.
- Reconnect the SIREPHOS plug and secure it.
- Reconnect the protective conductor using the ground screw.
- Do not install the rubber stop yet.
- Reinstall the collimator and connect it.
- Reinstall the dose measurement chamber / laser targeting device and connect them.



X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



- Perform the kV offset adjustment.
- Perform the generator adjustment (filament circuit learning program).
- Ensure that the collimator is functioning properly and is set correctly.
- Ensure that the collimator blades are centered in the blanking circle.
 - If possible, slightly loosen the Sirephos screws and tilt the SIREPHOS to adjust it.
 - Retighten the SIREPHOS screws.
- Ensure that the collimator blades of the iris diaphragm are visible during fluoroscopy in the survey format and zoom format on at least two sides of the monitor image.
- Check the display of the blades on the monitor screen and adjust if necessary.
- Check collimation for direct exposure if there is a cassette holder.
- Reinstall the rubber stop.
- Ensure that the area/dose product measurement device is functioning properly (if present).



- · Check the dose rate settings and adjust them if necessary.
- Check the settings of the maximum skin dose rate.

- Check the setting of the laser targeting device and, if necessary, adjust it according to the Adjustment Instructions for the Laser Targeting Device, RXR2-130.032.01.
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound. See Chapter 1 "Covers".

Replacing the I.I.

Checking the temperature indicator

- Prior to installing the I.I., check the temperature indicator:
 - ② If the inner square field of the indicator is white, the I.I. did not exceed the temperature range. Remove the temperature indicator.
 - ② If the indicator is discolored (inner field is black), proceed according to the IQ document RXD-000.038.01

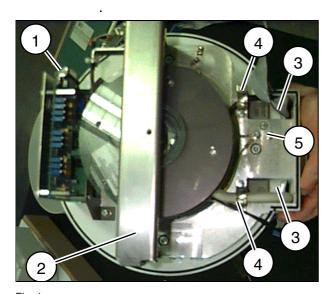


Fig. 1

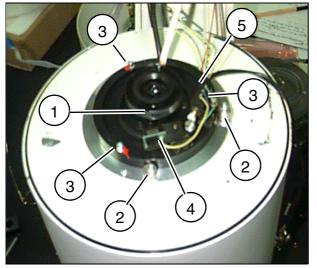


Fig. 3

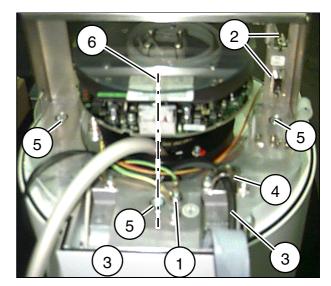


Fig. 2

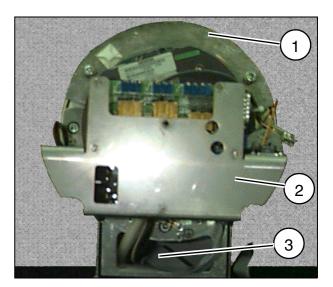


Fig. 4

Removing the old I.I.



Electrical voltage!
See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

- Turn the C-arm so that the I.I. is on top.
- Loosen the I.I. cover and remove it.
- Rotate the camera to the zero position (6/Fig. 2).
- Remove the cover adjacent to the I.I. above the high voltage section on the outer side of the C-arm.
- Remove the high voltage section and disconnect all cables.
- Dissipate any residual voltage in the cables by shorting them to ground.
- Remove the counterbalancing weight on the 7"/17 cm I.I. (1/Fig. 4).
- Remove the plug from the control section on the I.I. mini voltage supply (1/Fig. 1).
- Disconnect the protective conductor connections and the grounding screw (5/Fig. 1 / 1/Fig. 2).
- Remove plug D4.X1 of the VIDEOMED DC (2/Fig. 2).
- Secure the end of the cable which you have wound up on the cable reel of the Videomed DC with adhesive tape.
- Remove the cable between the VIDEOMED DC and the Compact optics and cut the cable ties securing it.
- Remove plug X45 of the cassette contact (2/Fig. 2).
- Remove both jacks D4.X1 and X45 from the receptacle (2/Fig. 2).
- Pull the "Anode, E3 and Penning" cables leading from the high voltage section to the I.I. out of the C-arm (3/Fig. 2).
- Loosen the retainer clip above the camera and remove it (2/Fig. 1 or 2/Fig. 4).
- Remove the control panel of the I.I. mini voltage supply from the 9"/23 cm I.I.
- Loosen the camera set screw slightly and remove the camera (1/Fig. 3).

NOTE

Do not loosen the eccentric screws (Fig. 3/2) on the edge of the Compact optics! These are used to center the Compact optics to the I.I. output screen. When removing the Compact optics, make sure that no dust or dirt contaminates the I.I. output window or the Compact optics.

- Loosen the Compact optics (3/Fig. 3).
- Remove the retaining clips on the cables (4/Fig. 1).
- Remove the O-ring and the cap nut from the anode cable.
- Disconnect plug M30.X1 (4/Fig. 3).

- Remove the Compact optics.
- To do this, pull the anode cable out of the Compact optics recess.
- Rotate the C-arm so that the I.I. is underneath and the tube assembly above.

∆CAUTION

Risk of crushing!

Noncompliance can cause damage to property.

Apply all C-arm brakes and hold the I.I. when removing the attachment screws.

- Remove the attachment screws from the I.I. mounting. When doing this, hold onto the I.I. (5/Fig. 2).
- Remove the I.I. from the mounting.

Installing the new I.I.

NOTE

When installing the Compact optics and the VIDEOMED DC, make sure that no dust or dirt contaminates the I.I. output window or the Compact optics.

- Prior to installing the new I.I. on the C-arm mounting, complete the following work.
- Reinstall the Compact optics on the new I.I.
 - When doing this, feed the anode cable through the recess in the optics. The Compact optics must sit adjacent to the eccentric screws.
- Move the camera rotation of the Compact optics to the zero position.
 - To do this, connect the ohmmeter to the potentiometer for camera rotation, position 2 and 3 (5/Fig. 3).
 - A resistance value of 5000 ohms, \pm 40 ohms must be measured for the center position.
 - Hold the camera rotation by the clamp ring (1/Fig. 3) and turn it to the correct position, if necessary.
- Place the VIDEOMED DC in the zero position on the Compact optics (6/Fig. 2) and clamp it in place.
- Connect the cable from the VIDEOMED DC to the Compact optics and secure it with cable ties.
 - Make sure that the cable lies in the recess of the VIDEOMED DC board and does not protrude past the edge of the board.
- Install the new control section included in the I.I. delivery volume.
- Connect cables E1, E2.
- Secure the new I.I. to the mounting with the screw.
 - The I.I. can be swivelled slightly to the side to permit easier cable routing.
- Route the cables for the high voltage section back through the recess in the I.I. (3/Fig. 1 or 3/Fig. 4).
- Swivel the I.I. back again.
 - When doing this, make sure that all the cables are correctly positioned.
- Secure the I.I. on the mounting (5/Fig. 2).

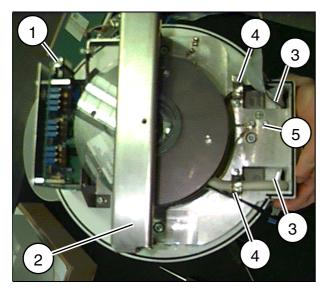
- The C-arm can now be rotated to permit easier installation of components (I.I. above, tube assembly underneath).
- Reinstall the O-ring and the cap nut on the anode cable.
 - The cable length from the beginning of the white wire to the cap nut should be 70 mm.
- Reinstall the high voltage section in the C-arm.
 - Reconnect all the cables.
- Reinstall the hand rail above the VIDEOMED DC.
- Reinstall both jacks D4.X1 for the VIDEOMED DC and X45 for the cassette contact on the receptacle.
- Reconnect the D4.X1 plug for the VIDEOMED DC and the X45 plug for the cassette contact.
- Reconnect plug M30.X1.
- Reconnect plug D120.X1 to the control section of the I.I. mini power supply.
- Reconnect the protective conductor to the ground screw (5/Fig. 1).
- Reinstall the cable clips (4/Fig. 1).
- Reinstall the counterbalance weight for the 7"/17 cm I.I.
 Check the existence of the sealing ring 6 /Fig. 3.

NOTE

Check the presence of the sealing ring 6/Fig. 3 at the new I.I. If none is present, remove the sealing ring from the old I.I. (glued to the I.I. housing with 4 to 6 dots), lay it in the groove of the new I.I. housing and fix it with 4 to 6 dots of adhesive (e.g. superglue).

Checks and adjustments

- Check the I.I. electrode voltages according to the test protocol for the I.I.
 - Do **not** readjust in cases where there are only slight deviations from the values on the test protocol (measurement device tolerances).
- Check that the camera optics are centered to the I.I. output and adjust them if necessary; refer to "Replacing the camera optics," subitem "Checking the centering of the camera optics to the I.I. output " and "Centering the camera optics to the I.I. output".
- Check the camera rotation and readjust it if necessary.
- Check the setting of the X-iris and readjust it if necessary.
- Check the display of the blades on the monitor and readjust if necessary.
- Check the dose rate and readjust it if necessary.
- · Perform the IQ Quick test.
 - When doing this, check the resolution first and, if necessary, readjust the optical resolution of the Compact optics.
- Complete the country-specific acceptance (§16 Partial acceptance... /DHHS...).





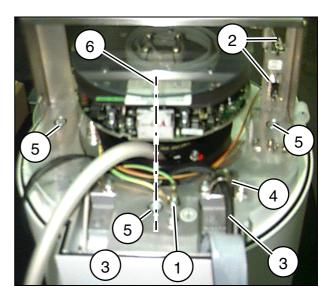
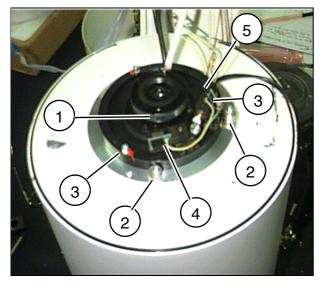


Fig. 6



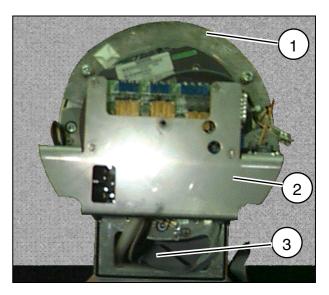


Fig. 7 Fig. 8

Replacing the Compact optics.

∆WARNING

Electrical voltage!
See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

Removing the Compact optics

- Turn the C-arm so that the I.I. is at the top.
- Loosen and remove the I.I. cover.
- Rotate the camera in the "0" position (6/Fig. 6).

- Remove the cover over the high voltage panel (C-arm away from you, I.I. near you).
- Remove the high voltage panel from the C-arm and remove the anode cable.
- Short out the residual charge to ground.
- Remove the O-ring and the cap nut from the anode cable.
- Withdraw the anode cable upward from the C-arm.
- Place the high voltage panel back in the C-arm for now.
- Disconnect the plugs of the control panel of the I.I. mini voltage supply (1/Fig. 5).
- Disconnect the protective conductor connections and the ground screw (5/Fig. 5).
- Remove plug D4.X1 of the VIDEOMED DC (2/Fig. 6).
- Secure the cable rolled-up in the cable spool of the VIDEOMED DC with adhesive tape.
- Remove plug X45 of the cassette contact (2/Fig. 6).
- Remove jacks D4.X1 and X45 from the clips (2/Fig. 6).
- Loosen the retainer clip above the camera and remove it (2/Fig. 5 or 2/Fig. 8).
- Remove the control panel from the 9"/23 cm I.I.
- Disconnect the plug from the VIDEOMED DC and the Compact optics.
- Cut off the cable ties.
- Loosen the camera set screw slightly and remove the camera (1/Fig. 7).

NOTE

Do not loosen the eccentric screws (2/Fig. 7) on the edge of the Compact optics. These are used to center the Compact optics to the I.I. output. When removing the Compact optics, make sure that no dust or dirt contaminates the I.I. output window or the Compact optics.

- Disconnect plug M30.X1 (4/Fig. 7).
- Loosen and remove the Compact optics (3/Fig. 7).
- Remove the rubber gasket.
- Remove the anode cable from the recess in the Compact optics.

Mounting the Compact optics

NOTE

When installing the Compact optics and the VIDEOMED DC, make sure that no dust or dirt contaminates the I.I. output window or the Compact optics.

- Reinsert the rubber gasket between the I.I. output and the camera optics. Reattach the Compact optics to the new I.I.
 - Insert the anode cable through the opening in the optics.
 - The Compact optics must lie against the excenter screws.
- Adjust the camera rotation of the Compact optics to the "0" position (6/Fig. 6).
- To do this, connect an ohm meter to the potentiometer for camera rotation, location 2 and 3 (5/Fig. 7). The resistance must measure 5000 ohms ± 40 ohms in the middle position.

Replacing boards / replacing components

- If necessary, adjust the camera with the clamping ring (1/Fig. 7) by rotating it to the correct position.
- Install the VIDEOMED DC in the "0" position on the Compact optics and secure it (6/Fig. 6).
- Connect the VIDEOMED DC Compact optics cable and secure it with cable ties.
 Make sure that the cable does not protrude past the edge of the board and that it lies in the recess of the VIDEOMED DC board.
- Insert the anode cables for the high voltage panel back into the C-arm (3/Fig. 5).
- Reinstall the O-ring and the cap nut on the anode cable.
 The cable length should be 70 mm from the beginning of the white wire to the cap nut.
- Reinstall the high voltage panel in the C-arm and reconnect all the cables.
- Mount the retainer clip above the VIDEOMED DC.
- Reconnect both jacks, D4.X1 for the VIDEOMED DC and X45 for the cassette contact to the retainer clip.
- Connect plugs D4.X1 for the VIDEOMED DC and X45 for the cassette contact.
- Connect plug M30.X1.
- Connect plug D120.X1 to the control panel of the I.I. mini voltage supply.
- Reconnect the protective conductor with the ground screw (5/Fig. 5).
- Reinstall the cable clamps (3/Fig. 6).
- Attach 2.1 mm Cu and 60 mm Al prefiltration to the radiation port of the SIREPHOS.
- Attach the resolution test to the I.I. input screen and check the optical resolution. Readjust it if necessary.
- Remove the resolution test from the I.I. input screen.
- Check the dose rate and readjust it if necessary.

Checking the camera optics centering at the I.I. output



X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

- Mark the center of the I.I. input as precisely as possible using a small washer and adhesive tape. If there is a laser light localizer, the I.I. attachment with the lead cross can also be used.
- Select the survey format.
- Move the camera into the 0° position.



- Switch fluoro on briefly.
- Mark the center of the washer or lead cross on the monitor (see Fig. 9).
- Rotate the camera in the -220° position.
- Mark the center again on the monitor (see Fig. 9).

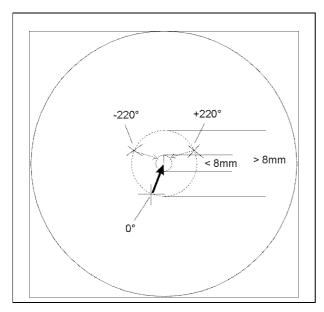


Fig. 9

- Rotate the camera in the in +220° position.
- Mark the center again on the monitor (see Fig. 9).
- Place an 8 mm washer over the three markings.
 All three markings must be located within the 8 mm diameter of the washer. An 8 mm washer has a somewhat larger inner diameter of 8.4 mm, therefore the markings must clearly lie within the inner diameter and should not touch the edge of the washer.
- If the diameter is <= 8 mm, the following centering adjustment does not have to be performed.
 Continue with "checks and adjustments".
- If the markings exceed > 8 mm, proceed as follows:

Centering the camera optics to the I.I. output



X-ray radiation! See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisite: The +220°, -220° and 0° positions were already marked as previously described.

- Rotate the camera optics back to the 0° position.
- Slightly loosen the three attachment screws of the camera optics.
- Slightly loosen both excenter screws adjacent to the camera optics.
- Move the camera optics toward the center, between both +220° and -220° markings (see also Fig. 9).



Switch fluoro on briefly and evaluate the position on the monitor. According to the ratio of
the I.I. input screen diameter to the I.I. output screen diameter, a shift of the camera optics by approximately 0.1 mm corresponds to a position shift of the washer displayed on
the monitor of more than 1.3 mm (17 cm I.I.) or 1.7 mm (23 cm I.I.).

6 - 14

Replacing boards / replacing components

- Secure the camera optics again.
- Erase the three markings on the monitor.



- Switch fluoro on briefly and mark the new 0° position.
- Rotate the camera to the -220° position.
- Mark the center on the monitor.
- Rotate the camera to the + 220° position.
- Mark the center on the monitor.
- Place an 8 mm washer over the three markings. All three markings must be located within the 8 mm diameter of the washer. An 8 mm washer has a somewhat larger inner diameter of 8.4 mm, therefore the markings must clearly lie within the inner diameter and should not touch the edge of the washer. If necessary, repeat the adjustment until the three markings fall within the 8 mm diameter.
- Secure the camera optics.
- Retighten the excenter screws of the camera optics.

Checks and adjustments



- Check the camera rotation and adjust it if necessary.
- Check the setting of the radiation iris and readjust it if necessary.
- Check the display of the blades on the monitor and adjust if necessary.
- Check the dose rate again and adjust it if necessary.
- Perform the IQ quick test.

MEMOSKOP C-E

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP C-E if you are able to select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP C-E according to the parameters recorded.

- Replace the MEMOSKOP C-E.
 The attachment screws are on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Configure the MEMOSKOP C-E for the correct video frequency and the number of monitors present.

Refer to Chapter 5 "MEMOSKOP C-E without Keyboard, Emulation ...", "Configuring the Video frequency" and "MEMOSKOP-Configuration for the number of existing monitors".

• Configure the following parameters in Technical Setup for the MEMOSKOP:

Number of monitors Configure 1 for SIREMOBIL Compact with 1 monitor.

Configure 2 for SIREMOBIL Compact with 2 monitors.

Hardcopy Check whether 5000 is programmed in "4 Max Hard-

copy time". If not, program this value.

Edge 1 coef set Check whether 3 is programmed, if not, program this

value.

Edge 2 coef set Check whether 8 is programmed, If not, program this

value

Motion detection setup Check whether the following are programmed MD1:

Threshold 100 and with MD2: Threshold 120.

If not, program these values.

Date / Time format Set to country-specific format.

Keyboard Set to the keyboard layout being used.

Display of realtime clock Configure Yes. Configure No only upon customer

request.

Display of rotated image Configure Yes.

Monitor zoom Configure No.

Default LUT Configure 2. Program a different LUT curve only upon

customer request.

Default Edge Configure 1. Program a different Edge enhancement

value only upon customer request.

Monitor split Configure Yes.

Monitor text Configure Yes.

Disable dose rate selection in

user setup

Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and Menu "Dose on Hardcopy output in User Setup are visi-

ble. Otherwise, set to "Yes".

Unit serial number Program the serial number of the SIREMOBIL Compact.

Do not enter the first zero.

Product name SIREMOBIL Compact (default). If wrong, configure

"SIREMOBIL Compact".

Default program changeable Default: Yes.

Depending on country specific regulations, configure

Yes or No.

Software backward compatible Configure No.

• Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters Upon customer request, change the parameters pro-

grammed for the organ program.

VCR output Configure to Monitor A.

Hardcopy Release For SIREMOBIL Compact with 1 monitor:

Configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

Configure to monitor B.

Text monitor For SIREMOBIL Compact with 1 monitor:

Configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

Configure to both monitors.

Split Screen Configure horizontally. Configure vertically only upon

customer request.

Display of time Configure Yes.

Set Date Time Set the current date and time.

Hospital Name Program the hospital name.

Storage Dose on Disk If the area dose product meter is present, (Diamentor)

configure Yes. Otherwise, configure No.

configure Yes. Otherwise configure No.

• Perform the IQ quick test.

MEMOSKOP C-E 100

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Keyboard

Language

The image storage MEMOSKOP C-E 100 is a new image storage that works only with the correct number of images. For this reason, if the image storage was set to it's default values (Menu "Diagnostics," "Load Factory Defaults"), the parameter "Maximum image numbers" must be set to 100 images.

Read and record the parameters for MEMOSKOP C-E 100 if you can select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP C-E 100 according to the parameters noted.

- Replace the MEMOSKOP C-E 100.
 The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C-E 100 to the correct video frequency and configure it for the number of existing monitors.
 Refer to Chapter 5 "Configuring the video frequency " and "MEMOSKOP - Configuration for the number of existing monitors".
- Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors	Configure 1 for SIREMOBIL Compact with 1 monitor. Configure 2 for SIREMOBIL Compact with 2 monitors.
Hardcopy	Check whether 5000 is programmed in "4 Max Hard-copy time". If not, program this value.
Edge 1 coef set	Check whether 3 is programmed, If not, program this value.
Edge 2 coef set	Check whether 8 is programmed, If not, program this value.
Motion detection setup	Check whether the following are programmed "MD1: Threshold" 100 and for "MD2: Threshold" 120. If not, program these values.
Date / Time format	Set the country-specific format.

Set to the keyboard layout being used.

Set for language of the country.

Display of rotated image Configure Yes.

Monitor zoom Configure No.

Monitor split Configure Yes.

Monitor text Configure Yes.

Maximum image number Configure 100.

Disable dose rate selection

in user setup

Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on disk" and menu "Dose on Hardcopy output" in User setup are visi-

ble. Otherwise, set to "Yes".

Unit serial number Program the serial number of the SIREMOBIL Compact.

Do not enter the first zero.

Product name SIREMOBIL Compact (default). If wrong, configure

"SIREMOBIL Compact".

Default Program changeable Default: Yes.

Depending on country specific regulations configure Yes

or No.

Create External disk Configure No.

Default LUT Configure 2. Program a different LUT curve only upon

customer request.

Default edge Configure 1. Program a different Edge enhancement

value only upon customer request.

Software backward compatible Configure No.

Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters Change the programmed parameters only upon cus-

tomer request.

VCR output Configure to monitor A.

Hardcopy Release For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

Configure to monitor B.

Text monitor For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

configure to both monitors.

Split screen Configure horizontally. Configure vertically only upon

customer request.

Display of time Configure Yes.

Set Date Time Set the current date and time.

Hospital Name Program the hospital.

figure Yes. Otherwise configure No.

figure Yes. Otherwise configure No.

• Perform the IQ quick test.

MEMOSKOP C/ MEMOSKOP C & MOD

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP if you can select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP according to the parameters noted.

- Replace the MEMOSKOP C.
 The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C to the correct video frequency and configure it for the number of existing monitors.

Refer to Chapter 5 "Configuring the video frequency" and "MEMOSKOP - Configuration for the number of existing monitors".

• Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors Configure 1 for SIREMOBIL Compact with 1 monitor.

Configure 2 for SIREMOBIL Compact with 2 monitors.

Hardcopy Check whether 5000 is programmed in "4 Max Hard-

copy time". If not, program this value.

Edge 1 coef set Check whether 3 is programmed, If not, program this

value.

Edge 2 coef set Check whether 8 is programmed, If not, program this

value.

Motion detection setup Check whether the following are programmed "MD1:

Threshold" 100 and for "MD2: Threshold" 120. If not,

program these values.

Date / Time format Set the country-specific format.

Keyboard Set to the keyboard layout being used.

Language Set for language of the country.

Display of rotated image Configure Yes.

Monitor zoom Configure No.

Monitor split Configure Yes.

Monitor text Configure Yes.

Maximum image number Configure 700.

Disable dose rate selection

in user setup

Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and menu "Dose on Hardcopy output" in User Setup are vis-

ible. Otherwise, set to "Yes".

Unit serial number Program the serial number of the SIREMOBIL Compact,

Do not enter the first zero.

Default LUT Configure 2. Only upon customers request program a

different LUT curve.

Default Edge Configure 1. Only upon customers request program a

different. Edge enhancement value

Software backward compatible Configure No.

Product name SIREMOBIL Compact (default). If wrong, configure

"SIREMOBIL Compact".

Default Program changeable Default: Yes.

Depending on country specific regulations, configure

Yes or No.

Create External disk If a MOD-drive is present or the option "DICOM bridge"

is installed, configure Yes. Without MOD drive or

DICOM bridge, configure No.

Enable Bridge If the option "DICOM bridge" is installed, configure Yes.

Otherwise configure No.

Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters
Change the programmed parameters only upon cus-

tomer request.

VCR output Configure to monitor A.

Hardcopy Release For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

Configure to monitor B.

Text monitor For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

configure to both monitors.

Split screen Configure horizontally. Configure vertically only upon

customer request.

Display of time Configure Yes.

Set Date Time Set the current date and time.

6 - 22 Replacing boards / replacing components

Hospital Name Program the hospital.

figure Yes. Otherwise configure No.

figure Yes. Otherwise configure No.

• Perform the IQ quick test.

MEMOSKOP C-SUB/ MEMOSKOP C-SUB & MOD

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP C-SUB if you can select User setup.

After replacing, configure the MEMOSKOP C-SUB according to the parameters recorded.

- Replace the MEMOSKOP C-SUB.
 The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C-SUB to the correct video frequency and configure it for the number of existing monitors.

Refer to Chapter 5 "Configuring the video frequency" and "MEMOSKOP - Configuration for the number of existing monitors".

• Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors	Configure 1 for SIREMOB	L Compact with 1 monitor.
--------------------	-------------------------	---------------------------

Configure 2 for SIREMOBIL Compact with 2 monitors.

Hardcopy Check whether 5000 is programmed in "4 Max Hard-

copy time". If not, program this value.

Edge 1 coef set Check whether 3 is programmed, If not, program this

value.

Edge 2 coef set Check whether 8 is programmed, If not, program this

value

Motion detection setup Check whether the following are programmed "MD1:

Threshold" 100 and for "MD2: Threshold" 120. If not,

program these values.

Date / Time format Set the country-specific format.

Keyboard Set to the keyboard layout being used.

Language Set for language of the country.

Display of rotated image Configure Yes.

Monitor zoom Configure No.

Monitor split Configure Yes.

Monitor text Configure Yes.

Maximum image number Configure 800.

Disable dose rate selection

in user setup

Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and menu "Dose on Hardcopy output" in User Setup are vis-

ible. Otherwise, set to "Yes".

Unit serial number Program the serial number of the SIREMOBIL Compact.

Do not enter the first zero.

Subtraction K-Factor,

phase A

Program "32". Program a different value only upon cus-

tomer request.

Subtraction K-Factor,

phase B

Program "MD 2". Program a different value only upon

customer request.

Product name SIREMOBIL Compact (default). If wrong, configure

"SIREMOBIL Compact".

Default Program changeable Default: Yes.

Depending on country specific regulations, configure

Yes or No.

Create External disk If a MOD-drive is present or the option "DICOM bridge"

is installed, configure Yes. Without MOD drive or

DICOM bridge, configure No.

Enable Bridge If the option "DICOM bridge" is installed, configure Yes.

Otherwise configure No.

Software backward compatible Configure No.

Default LUT Configure 2. Only upon customers request program a

different LUT curve.

Default Edge Configure 1. Only upon customers request program a

different. Edge enhancement value

Default LUT for subtraction Configure 1. Only upon customers request program a

different LUT curve.

Subtraction Time of phase A Program "4.5".

Program a different value only upon customer request.

Roadmap K-Factor, phase A Program "32".

Program a different value only upon customer request.

Roadmap K-Factor, phase B Program "MD 2".

Program a different value only upon customer request.

Roadmap K-Factor, phase C Program "MD 2".

Program a different value only upon customer request.

Roadmap Time of phase A Program "4.5".

Program a different value only upon customer request.

• Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters Change the programmed parameters only upon cus-

tomer request.

VCR output Configure to monitor A.

Hardcopy Release For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

Configure to monitor B.

Text monitor For SIREMOBIL Compact with 1 monitor:

configure to monitor A.

For SIREMOBIL Compact with 2 monitors:

configure to both monitors.

Split screen Configure horizontally.

Configure vertically only upon customer request.

Display of time Configure Yes.

Set Date Time Set the current date and time.

Hospital Name Program the hospital.

figure Yes. Otherwise configure No.

figure Yes. Otherwise configure No.

• Perform the IQ quick test.

MULTISPOT 2000



Electrical voltage! See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

Before installing the new MULTISPOT 2000, set the correct refresh rate.

50 Hz refresh rate		60 Hz refresh rate	
Jumper	Position	Jumper	Position
X4	b	X4	а
X5	open	X5	open
X6	b	X6	а
X7	b	X7	а
X8	b	X8	а
X9	b	X9	а
X10	b	X10	а
X11	b	X11	а

Tab. 1

- Disconnect the SIREMOBIL Compact line voltage plug from the receptacle.
- Replace the MULTISPOT 2000.
- The screws securing the MULTISPOT 2000 are accessible on the underside of the camera.
- Perform a camera function test after the replacement.
- Generate and program the exposure parameters for the MULTISPOT 2000 according to the IQ Quick test (refer to the log book). Record the new exposure parameters in the IQ Quick test instructions.

Area dose product measurement device

- Remove the SIREPHOS cover (see Chapter 1, "Covers").
- Replace the electronics board and the dose measurement chamber.
- Perform the calibration of the area/dose product measurement device.
 Refer to Chapter 5 "Calibrating the Area Dose Product Measurement".
- Test the accuracy of the area dose product measurement device. Refer to Chapter 5 "Testing the accuracy of the area dose product measurement device".
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound (see Chapter 1, "Covers").

Laser targeting device

- Remove the SIREPHOS cover (see Chapter 1, "Covers").
- Replace the laser diodes after removing the plastic bracket and desoldering the wires.
- Adjust the laser diodes using the adjustment device supplied with the laser targeting device.
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound (see Chapter 1, "Covers").

6 - 28 Replacing boards / replacing components

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Brake forces



Risk of physical injury and damage to property!

When performing service work on the horizontal slide of the basic unit (for example when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and drop onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked in order to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.

See also page 1-8 "Back stop plate at the C-arm horizontal support"

- Position prerequisites for measuring the forces: angulation, orbital, and horizontal swivel
 movements must be at zero on the scale and horizontal movement should be at 20 on
 the scale.
- All measurements should be made with a spring measure on the railing near the image intensifier with the DHHS spacer, if present, installed on the X-ray tube.

SIREMOBIL Compact L

Movement	Nominal values		Comments
	Brake released:	Brake applied:	
Horizontal travel	10 N to 40 N	160 N to 200 N	n.a.
Angulation movement	10 Nm to 20 Nm	60 Nm to 80 Nm	n.a.
Orbital movement	10 Nm to 24 Nm	60 Nm to 80 Nm	measure with the C-arm in vertical position.
Horizontal swivel	5 Nm to 10 Nm	90 Nm to 150 Nm	n.a.

SIREMOBIL Compact

Movement	Nominal values		Comments
	Brake released:	Brake applied:	
Horizontal travel	≥ 20 N / <u><</u> 35 N	≥ 160 N	n.a.
Angulation	<u><</u> 17 Nm	<u>></u> 40 Nm	n.a.
Orbital movement	≥10 N / ≤ 24 N	≥ 65 N	measure with the C-arm in vertical position.
Horizontal swivel	<u><</u> 10 Nm	≥ 90 Nm	n.a.

Lubricating the vertical column

- The spindle in the vertical column should be lubricated during annual maintenance.
- Raise the vertical column approximately 50 cm. A drilled hole is visible in the column.
- Fill this hole with approximately 2 cm³ of oil.

Oil to be used:

Special purpose oil (Optimol GmbH; Viscogen KL300; 40 g), Item number 73 95 353 RH090.

∆WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

NOTE

When measuring the tube current, the distribution current must be derived from the measured value. The distribution current depends upon the kV and is calculated according to Ohm's law. The distribution resistance is 400 MOhm.

- Switch OFF SIREMOBIL Compact.
- Remove jumper X97 from board D1.
- Connect the mA measuring device at D1.X39 and D1.X40.
- Switch ON SIREMOBIL Compact.



- Release radiation and read the overall current.
- Read out the kV value produced while the current is being measured.

Calculate the tube current as follows:

e.g.:

At 110kV, an overall current of 5.275 mA is measured.

tube current [mA] = 5.275 [mA] -
$$\frac{110 \text{ [kV]}}{400 \text{ [MOhm]}}$$
 = 5.275 [mA] - 0.275 [mA] = $\frac{5.0 \text{ [mA]}}{600 \text{ [mA]}}$

Supplement, Measuring the tube current

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8	

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Chapter 0 Cover page, revision level, table of contents revised

Chapter 1 to chapter 9 Revision level revised.
Chapter 1 Safety information added.

Chapter 9 Changes to previous version revised

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